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CLAIMS

1. Process for the preparation of aqueous dispersions of latex particles having a heterogeneous morphology by a semicontinuous emulsion polymerization, comprising the emulsion polymerizing of ethylenically unsaturated (co)monomers, accompanied by the addition of cationic and/or anionic and/or nonionic emulsifiers and/or protective colloids as stabilizers, which are directly used as such or synthesized in situ, the semicontinuous emulsion polymerization being performed in the presence of the stabilizer or stabilizers with a monomer mixture, which

a) contains at least one nonionic, ethylenically unsaturated monomer with a glass transition temperature Tg above about 30°C in a quantity of about 10 to 70 wt.%, based on the total weight of ethylenically unsaturated (co)monomers and

b) at least one hydrophilic, ethylenically unsaturated monomer in a quantity of about 5 to 30 wt.%, based on the total weight of ethylenically unsaturated (co)monomers.

2. Process according to claim 1, characterized in that the emulsion polymerization is performed in the presence of an in situ formed seed and for forming the seed use is made of ethylenically unsaturated (co)monomers in a quantity of about 0.01 to 25 wt.%, based on the total weight of the ethylenically unsaturated (co)monomers.

3. Process according to claim 1 or 2, characterized in that the stabilizer is a (co)polymer with cationic functionality, which is obtained by (co)polymerization in the aqueous medium of ethylenically unsaturated (co)monomers, wherein at least one (co)monomer has a cationic functionality.

4. Process according to claim 3, characterized in that the cationic functionality is attributed to a quaternary ammonium group.

5. Process according to claim 3 or 4, characterized in that the (co)monomers additionally have at least one anionic functionality.

6. Process according to at least one of the preceding claims, characterized in that the (co)monomers incorporate at least one protonated, reactive group, which is deprotonated accompanied by a suitable rise in the pH-value.

7. Process according to at least one of the preceding claims, characterized in that the glass transition temperature Tg of the nonionic monomer is between about 30 and 120°C, particularly between about 50 and 110°C.

8. Process according to at least one of the preceding claims, characterized in that the hydrophilic, ethylenically unsaturated monomer has at least one acid functionality.

9. Process according to claim 8, wherein the hydrophilic, ethylenically unsaturated monomer is chosen from the group consisting of acrylic acid, methacrylic acid, acryloxypropionic acid, (meth)acryloxypropionic acid, acryloxyacetic acid, methacryloxyacetic acid, crotonic acid, itaconic acid, aconitic acid, maleic acid, maleic anhydride, fumaric acid, monomethyl maleate, monomethyl itaconate, monomethyl fumarate and mixtures thereof.

10. Process according to at least one of the preceding claims, wherein the hydrophilic, ethylenically unsaturated monomer is an acrylic or methacrylic acid.

11. Process according to at least one of the preceding claims, characterized in that the nonionic, ethylenically unsaturated monomer is chosen from the group consisting of styrene, styrene derivatives, such as alpha-methyl styrene, o-, m- and p-methyl styrene, o-, m- and p-ethyl styrene, o,p-dimethyl styrene, o,p-diethyl styrene, isopropyl styrene, o-methyl-p-isopropyl styrene, o,p-chloro styrene, p-bromo styrene, o,p-dichloro styrene, o,p-dibromo styrene, vinyl toluene, ethylene, vinyl acetate, vinyl chloride, vinylidene chloride, vinyl propionate, vinyl-n-butyrate, vinyl laurate, vinyl pivalate and vinyl stearate, VEOVA® 9 to 11, (meth)acrylamide, (C_1-C_{20})-alkyl esters of (meth)acrylic acid or (C_1-C_{20})-alkenyl esters of (meth)acrylic acid with alkanols having 1 to 12 C-atoms, such as acrylic and methacrylic acid methyl, ethyl, n-butyl, isobutyl, t-butyl and 2-ethylhexyl esters, nitriles, alpha, beta-monoethylenically unsaturated carboxylic acids, such as acrylonitrile, as well as C_4-C_8-conjugate dienes, such as 1,3-butadiene and isoprene, monomers having two vinyl groups, two vinylidene groups or two alkylene groups, such as diesters of dihydric alcohols with alpha,beta-monoethylenically unsaturated monocarboxylic acids.

12. Process according to at least one of the preceding claims, wherein the nonionic, ethylenically unsaturated monomer is styrene or a styrene derivative.

13. Process according to at least one of the preceding claims, characterized in that for one part by weight of hydrophilic, ethylenically unsaturated monomer with at least one acid functionality there are about 70 parts by weight (co)monomers.

14. Process according to at least one of the preceding claims, characterized in that the (co)polymeric seed or latex particles are substantially monodisperse.

15. Process according to at least one of the preceding claims, characterized in that the latex particles have an average diameter of about 30 to 1000 nm, particularly about 50 to 600 nm.

16. Aqueous dispersion of latex particles having a heterogeneous morphology, obtainable according to a process according to at least one of the claims 1 to 15.

17. Dispersion according to claim 16, characterized in that the dispersion comprises a mixture of an aqueous dispersion 1 with one kind of latex particles and a further aqueous dispersion 2 with other latex particles.

18. Dispersion according to claim 17, characterized in that the weight ratio of dispersion 1 to dispersion 2 is in the range of about 5:95 to 95:5, preferably about 10:90 to 90:10, particularly about 20:80 to 80:20.

19. Dispersion according to one of claims 17 or 18, characterized in that dispersion 2 is an aqueous dispersion of homopolymers or copolymers, selected from the monomers vinyl acetate, ethylene, vinyl versatate, acrylate, methacrylate, styrene and/or butadiene, which build up the polymers.

20. Latex particles with heterogeneous morphology, obtainable from an aqueous dispersion according to one of claims 16 to 19 by corresponding water removal.

21. Latex particles according to claim 20, characterized in that the latex particles have a heterogeneous morphology, in which the hydrophilic areas are substantially in an inner phase and the hydrophobic areas substantially in an outer phase and the polymers of the hydrophilic areas are covered by the polymers of the hydrophobic areas.

22. Latex particles according to claim 21, characterized in that the polymers of the hydrophilic areas are alkali-soluble.

23. Latex particles with heterogeneous morphology in the form of a redispersible powder, obtainable from an aqueous dispersion according to one of claims 16 to 19 by corresponding water removal, particularly by spray or freeze drying.

24. Latex particles according to claim 23, characterized in that the redispersible powder comprises a mixture of powder 1 of one kind of latex particles and a further powder 2 of other latex particles.

25. Latex particles according to claim 24, characterized in that the weight ratio of powder 1 to powder 2 is in the range of about 5:95 to 95:5, preferably about 10:90 to 90:10, particularly about 20:80 to 80:20.

26. Latex particles according to one of claims 24 or 25, characterized in that the powder 2 is a powder of homopolymers or copolymers, selected from the monomers vinyl acetate, ethylene, vinyl versatate, acrylate, methacrylate, styrene and/or butadiene, which build up the polymers.

27. Use of an aqueous dispersion according to one of claims 16 to 19 in composite and coating mortars, cement dyes and adhesives, plastics-containing, cement-bound systems, particularly mortars, and plastics-bound, cement-free binders, particularly in cement-free mortars, gypsum mortars, primers, plasters, carpet, wood, powder and floor adhesives, as well as in wallpaper pastes, disperse powdered dyestuffs and glass fibre composite systems.

28. Use of the latex particles with heterogeneous morphology in the form of the redispersible powder according to one of claims 23 to 26 in composite and

coating mortars, cement dyes and adhesives, plastics-containing, cement-bound systems, particularly mortars, and plastics-bound, cement-free binders, particularly in cement-free mortars, gypsum mortars, primers, plasters, carpet, wood, powder and floor adhesives, as well as in wallpaper pastes, disperse powdered dyestuffs and glass fibre composite systems, as a filling material for columns in chromatographic separation processes, particularly in gas chromatography and high pressure liquid chromatography (HPLC), as well as a calibrating material for particle size measuring instruments.

29. Use of latex particles with heterogeneous morphology in the form of the redispersible powder according to one of claims 23 to 26 as carriers for the delayed release of active substances of all types, particularly in the agricultural sector for fungicides, herbicides, phytohormones, insecticides, nematicides, rodenticides, acaricides, etc., in the food sector for vitamins, mineral substances, etc., or in the pharmaceutical sector for the administration of medicaments.